

WHAT IS CLAIMED IS:

- 1 1. A method of opening a narrowed region in a blood vessel, comprising the
2 steps of:
3 providing a liner movable from a collapsed condition to an expanded
4 condition;
5 advancing the liner to a narrowed region of a blood vessel with the liner in the
6 collapsed position;
7 passing at least a portion of the liner through the narrowed region of the blood
8 vessel in the collapsed position;
9 positioning a stent in the liner so that the stent is also positioned in the
10 narrowed region of the blood vessel, the liner preventing the stent from contacting the
11 narrowed region of the blood vessel; and
12 expanding the stent to open the narrowed region of the vessel.
- 1 2 The method of claim 1, wherein:
2 the advancing and passing steps are carried out with the blood vessel being a
3 vessel selected from the group comprising the internal carotid artery and saphenous
4 vein graft.
- 1 3. The method of claim 1, further comprising the step of:
2 expanding the liner before expanding the stent.
- 1 4. The method of claim 1, wherein:
2 the liner is expanded by the stent.
- 1 5. The method of claim 1, wherein:
2 the providing step is carried out with the liner being mounted to a delivery
3 catheter.
- 1 6. The method of claim 1, wherein:
2 the providing step is carried out with the liner having an expandable anchor
3 coupled to the liner.

- 1 7. The method of claim 6, wherein:
2 the anchor is attached to the proximal end of the liner.
- 1 8. The method of claim 6, further comprising the step of:
2 expanding the anchor with a balloon.
- 1 9. The method of claim 6, further comprising the steps of:
2 holding the anchor in a collapsed position; and
3 the expanding step is carried out by releasing the anchor so that the anchor
4 moves into contact with the vessel wall and toward an expanded condition.
- 1 10. The method of claim 9, wherein:
2 the anchor is expanded in the internal carotid artery.
- 1 11. The method of claim 10, wherein:
2 the anchor expanding step is carried out so that the anchor is positioned at the
3 bifurcation of the internal and external carotid arteries.
- 1 12. The method of claim 1, wherein:
2 the providing step is carried out with the liner having a number of folded
3 sections in the collapsed position.
- 1 13. The method of claim 12, wherein:
2 the folds are separated by longitudinal creases.
- 1 14. The method of claim 12, wherein:
2 the providing step is carried out with the folded sections being wrapped.
- 1 15. The method of claim 12, wherein:
2 the providing step is carried out with at least two folded sections.
- 1 16. The method of claim 12, wherein:

2 the providing step is carried out with the folded sections being adhered to one
3 another to hold the folded sections in the collapsed position.

1 17. The method of claim 16, wherein:
2 the providing step is carried out with the folded sections adhering to one
3 another by application of heat to the folded sections.

1 18. The method of claim 16, wherein:
2 the providing step is carried out with the folded sections adhering to one
3 another with an adhesive.

1 19. The method of claim 16, wherein:
2 the providing step is carried out with the folded sections being adhered to one
3 another with gelatin, sucrose, glue, low molecular weight polyvinyl alcohol, suture, or
4 fusion or soldered with radiopaque wire or ribbon.

1 20. The method of claim 1, wherein:
2 the providing step is carried out with the liner being at least partially covered
3 by a coating in the collapsed position, the coating dissolving in blood.

1 21. The method of claim 1, wherein:
2 the providing step is carried out with the distal end of the liner being covered
3 with a coating which forms a curved,atraumatic surface and covers a distal end of the
4 folded sections.

1 22. The method of claim 1, wherein:
2 the providing step is carried out with the liner being carried by a delivery
3 catheter, the liner extending from a distal end of the delivery catheter.

1 23. The method of claim 1, wherein:
2 the advancing the step is carried out by advancing the liner over a guidewire.

1 24. The method of claim 23, wherein:

2 the providing step is carried out with the liner having a radial thickness of less
3 than 0.020 inch in the collapsed position, the thickness being measured in a radial
4 direction relative to a hole in which a guidewire is positioned.

1 25. A method of protecting a body passage, comprising the steps of:

2 providing a liner movable from a collapsed condition to an expanded
3 condition, the liner evertting when moving from the collapsed condition to the
4 expanded condition;

5 advancing the liner to a region of a passageway in a body with the liner in the
6 collapsed position;

7 passing at least a portion of the liner through the region of the passageway in
8 the collapsed position, at least a portion of the liner evertting when moving from the
9 collapsed position to the expanded position.;

10 positioning a device in the liner so that the device is also positioned in the
11 region of the passageway, the liner preventing the device from contacting the region of
12 the passageway.

1 26. A device for protecting a passageway in a body when passing other devices
2 through the passageway, comprising:

3 a delivery catheter having a distal end; and

4 a liner coupled to the delivery catheter, the liner being movable from a
5 collapsed position to an expanded position, the liner extending for a length of at least
6 2 cm and having a diameter of no more than 0.060 inch along the length when in the
7 collapsed position.

1 27. The system of claim 26, wherein:

2 the liner is releasably coupled to the delivery catheter and extending distally
3 from the distal end of the delivery catheter.

1 28. The system of claim 26, wherein:

2 the liner forms a throughhole which receives a guidewire when advancing the
3 liner through a narrowed vessel.

- 1 29. The system of claim 26, wherein:
2 the liner has an expandable anchor for moving an end of the liner toward the
3 expanded position.
- 1 30. The system of claim 26, wherein:
2 the anchor is mounted to an inflatable balloon which expands the anchor.
- 1 31. The system of claim 26, wherein:
2 the balloon has a proximal portion which extends beyond the anchor, the
3 proximal portion expanding more than the anchor initially so that the proximal portion
4 occludes the vessel before full expansion of the anchor.
- 1 32. The system of claim 26, wherein:
2 the liner forms a number of folded sections in the collapsed position.
- 1 33. The system of claim 32, wherein:
2 the liner has at least two folded sections.
- 1 34. The system of claim 32, wherein:
2 the folded sections are wrapped around one another.
- 1 35. The system of claim 26, wherein:
2 the liner has a diameter of no more than 0.060 inch along the length in the
3 collapsed position.
- 1 36. The system of claim 26, wherein:
2 the liner expands to a diameter of at least 4 mm in the expanded condition.
- 1 37. The system of claim 26, wherein:
2 at least the distal end of the liner is covered by a coating, the coating covering
3 the distal end of the folded sections.
- 1 38. The system of claim 26, wherein:

2 the liner is a tube of material when in the expanded condition.

1 39. The system of claim 26, wherein:

2 the delivery catheter has an expandable section, the expandable section being

3 movable from a collapsed condition to an expanded condition; and

4 a proximal end of the liner being coupled to the expandable section so that the
5 proximal end of the liner is expanded when the expandable section is expanded.

1 40. The system of claim 39, wherein:

2 the expandable section is coupled to an inflation lumen and is inflated when

3 moving to the expanded condition.

1 41. The system of claim 40, wherein:

2 the liner is releasably attached to the expandable section.

1 42. A method of advancing a device through a passageway in a body, comprising
2 the steps of:

3 providing a liner movable from a collapsed condition to an expanded
4 condition;

5 advancing the liner to region in a passageway in a body with the liner in the
6 collapsed position;

7 passing at least a portion of the liner into the region in the collapsed position;
8 and

9 introducing a device into the liner so that the device is also positioned in the
10 region of the passageway, the liner preventing the device from contacting the region of
11 the passageway.

1 43. The method of claim 42, wherein:

2 the introducing step is carried out with the device selected from the group
3 consisting of a stent, filter, angioplasty balloon, drug delivery device or catheter, laser
4 catheter, and ultrasound catheter.

1 44. The method of claim 42, further comprising the step of:

2 expanding the stent to trap the liner between the stent and the vessel wall.

1 45. The method of claim 42, wherein:

2 the providing step is carried out with the liner having an outer diameter
3 of no more than 0.065 inch in the collapsed position.

1 46. The method of claim 45, wherein:

2 the providing step is carried out with the liner having an outer diameter of no
3 more than 0.040 inch in the collapsed position.

1 47. The method of claim 42, wherein:

2 the providing step is carried out with the liner being collapsed to a radial
3 thickness of no more than 0.025 inch.

1 48. The method of claim 42, wherein:

2 the providing step is carried out with the liner being collapsed to a radial
3 thickness of no more than 0.020 inch.

1 49. The method of claim 42, wherein:

2 the providing step is carried out with the liner being mounted onto a tube of
3 material having a lumen; and
4 the advancing step is carried out with the liner being advanced over a
5 guidewire passing through the lumen in the tube.

1 50. The method of claim 42, wherein:

2 the providing step is carried out with the liner having a length to width ratio of
3 at least 20 to 1.

1 51. The method of claim 42, wherein:

2 the providing step is carried out with the liner having a length to width ratio of
3 at least 40 to 1.

1 52. The method of claim 42, wherein:

2 the providing step is carried out with the liner having a length to width ratio of
3 at least 60 to 1.

1 53. A device for protecting a passageway in a body when passing other devices
2 through the passageway, comprising:

3 a liner movable from a collapsed position to an expanded position, the liner
4 having a diameter of no more than 0.018 inch in the collapsed position, the liner
5 having an outer diameter of no more than 0.040 inch when in the collapsed position;
6 and

7 an expandable anchor attached to the liner, the anchor being movable from an
8 expanded shape to a collapsed shape, the anchor being configured to hold the liner at a
9 position in a passageway in a body.

1 54. The device of claim 53, wherein:

2 the liner has an outer diameter of no more than 0.026 inch.

1 55. The device of claim 53, wherein:

2 the liner has a length, the length to diameter ratio for the liner being at least 20
3 to 1.

1 56. The device of claim 55, wherein:

2 the length to diameter ratio is at least 50 to 1.

1 57. The device of claim 55, wherein:

2 the length to diameter ratio is at least 80 to 1.

1 58. The device of claim 55, wherein:

2 the anchor is mounted inside a delivery catheter which holds the anchor in the
3 collapsed position, the anchor being naturally biased toward the expanded position.

1 59. The device of claim 53, further comprising:

2 a retractable sheath disposed over the liner when the liner is in the collapsed
3 position.

1 60 The device of claim 53, further comprising:
2 an inner tube which has a throughhole to receive a guidewire, the liner being
3 mounted over the inner tube so that the inner tube prevents the liner from contacting
4 the guidewire.

1 61. The device of claim 53, wherein:
2 the liner has a thickness in a radial direction of no more than 0.012 inch.

1 62. The device of claim 53, wherein:
2 the liner has a first end and a second end, the anchor being attached to the first
3 end and the liner being free at the second end when in the expanded position.

1 63. The device of claim 53, wherein:
2 the liner forms folds in the collapsed position.

1 64. The device of claim 53, wherein:
2 the liner has a flexible, non-metallic tube.

1 65. The device of claim 64, wherein:
2 the liner has an expandable metallic anchor which is configured to open an end
3 of the flexible tube.

1 66. The device of claim 53, wherein:
2 the liner has a collapsed diameter of 0.020 inch to 0.032 inch.

1 67. A method of protecting a body passageway when advancing a device through
2 the body passageway, comprising the steps of:
3 providing a liner movable from a collapsed condition to an expanded
4 condition, the liner having an anchor at an end of the liner to anchor the end of the
5 liner in the passageway;
6 advancing the liner to a region of a passageway in a body with the liner in the
7 collapsed position;

8 expanding the anchor with an expandable device, the expandable device and
9 the anchor blocking fluid flow through the passageway;
10 passing at least a portion of the liner through the region of the passageway in
11 the collapsed position;
12 positioning a device in the liner so that the device is also positioned in the
13 region of the passageway, the liner preventing the device from contacting the region of
14 the passageway.